

myself living in a similar relation with *Crematogaster parabiatica* in Colombia, Panama and Guatemala. I have reproduced Mann's observations in full because they show very clearly that his "nest" of *Odontomachus* and *Dolichoderus* was really an "ant-garden" of the type described and figured by Ule (1901), and as the observations I have to record relate to these same structures, a more detailed account of them will not be out of place.

While studying the Brazilian hylaea in 1900 Ule found attached to the branches of trees, in certain localities, balls of earth bristling with epiphytes in various stages of germination and growth and inhabited by colonies of ants. The densely felted rootlets of the plants kept the particles of soil together and formed the walls of the galleries and chambers occupied by the insects. The ants he took from these singular structures, which he called "ant-gardens" and later "flower-gardens" (1901, 1905, 1906) were identified by Forel (1904) as *Camponotus femoratus* Fabr. and three closely allied species of *Azteca* (*trailsi* Emery, *olitrax* Forel and *ulei* Forel). Ule (1905, 1906) distinguished two kinds of gardens according to their flora and the size of the ant they contained. On those tenanted by the larger species (*C. femoratus*) he collected the following plants: *Philodendron myrmecophilum* Engl., *Anthurium scolopendrinum* Kunth. var. *poiteauanum* Engl., *Streptocalyx angustifolius* Mez., *Aechmea spicata* Mart., *Peperomia nematostachya* Link, *Codonanthe uleana* Fritsch, and *Phyllocactus phyllanthus* Link. The gardens inhabited by the three small ants of the genus *Azteca* yielded *Philodendron myrmecophilum* Engl., *Nidularium myrmecophilum* Ule, *Ficus myrmecophila* Warb., *Marckea formicarum* Damm., *Ectozoma ulei* Damm., *Codonanthe formicarum* Ule and two undescribed species of Gesneriaceae. These fourteen species belonged to such different families as the Araceae, Bromeliaceae, Gesneriaceae, Moraceae, Piperaceae and Cactaceae. Notwithstanding this diversity he believed he could detect certain common peculiarities not seen in other epiphytes, notably in the structure of the roots, leaves and fruit. The fruit is usually berry-like and the seeds larger than in epiphytes growing elsewhere. He also maintains that they grow only on the ant-nests. He inferred that "the ants sow and care for these plants, which would otherwise be unable to exist, but in return enable the ants to construct arboreal nests insured against being washed away by the torrential rains and protected from the scorching rays of the sun." Ule performed some experiments which seemed to indicate that the ants may actually collect the seeds of the epiphytes. "On several occasions," he says, "I squeezed the seeds out of the berries of a *Nidularium*, another Bromeliad, related to *Portea*, and one of the Gesneriaceae onto the branches, and observed the behavior of the ants. At first they merely lapped up the juice, but on finding the seeds carried them away forthwith to the protection of their nests. On one occasion the little creatures seized the seeds at once and made off with them."